

Review of World Trade Center Cleanup Confirmation Sampling “Strategy”

Reviewer: Guiseppe-Elie

Charge to the Reviewers

From the background section above, it should be clear that the cited document in the letter, *World Trade Center Indoor Air Assessment and Selection of Contaminants of Concern and Setting Health-Based Benchmarks*, was not the document which concluded that asbestos was an appropriate surrogate in determining risk for other contaminants. In fact, the conclusion as specifically cited from the Confirmation Cleaning Study, itself did not identify asbestos as the “appropriate surrogate in determining risk for other contaminants”, but rather that, “asbestos air sampling was a conservative method for determining if additional cleaning was required.”

This was based on the finding that when asbestos air measurements could not be reliably analyzed due to overloaded filters or the results were found to be very low or not detected in post-cleaning sampling in this study, other contaminants were found to be low or not detected in both air and wipe tests. It can be inferred, therefore, that for WTC-related dust, asbestos might be a surrogate for determining risk from other contaminants - it has just never been stated as such in the Confirmation Cleaning Study, and certainly was not even addressed in the COPC document.

With that as a comment, the first charge question is:

1. The Confirmation Cleaning Study concluded, "asbestos air sampling was a conservative method for determining if additional cleaning was required". Given this conclusion and its supporting data in the Confirmation Cleaning Study, and all other data sources, is the selection of asbestos as a surrogate for determining the risk from other contaminants in the manner used by EPA supported? Please provide a detailed response, explaining the reasoning behind your yes or no response."

Specifically, EPA conducted what they termed a "modified aggressive" asbestos air sampling method and they deemed the apartment "cleared" unless two conditions occurred: 1) the filter was "overloaded" such that a reliable asbestos measurement could not be made, or 2) a reliable measurement could be made and the concentration was greater than or equal to the health-based benchmark of 0.0009 f/cc. An apartment was "cleared" if an asbestos measurement could be reliably made and the result was a non-detect or a detect below the health benchmark. If an apartment was not "cleared" a re-cleaning was offered and accepted in most cases. "In the manner used by EPA" does not translate to sampling for asbestos in either (or both) dust and air, but only in air.

Response: Based on a review of the all of the information provided, I would concur with the statement "asbestos air sampling was a conservative method for determining if additional cleaning was required". Specifically, the Interim Final WTC Residential

Confirmation Cleaning Study provides a reasonable logical approach to evaluating cleaning methods and sampling strategies that reached this conclusion.

The need for a surrogate is important because of the magnitude of the effort. In addition, the use of a “risk” driver constituent is appropriate to develop the surrogate.

The key components of the evaluation included:

- Selection of chemicals of potential concern (COPC)
- Development of health-based screening benchmarks
- Sampling buildings for these COPCs in appropriate media (before and after cleaning)
- Evaluation of results

The initial steps of determining an appropriate surrogate were the selection of COPCs and the development of their associated health-based screening benchmarks. These steps are critical in determining which constituents are likely to present the most significant potential risk. In these steps, a combination of both the toxicity and potential exposure are considered to determine potential risks. Although a number of constituents were detected in the WTC “dusts”, an evaluation based on this risk potential (that is, using a combination of the number of times detected, the maximum detected and toxicity characteristics) appropriately narrowed the list to a manageable few. From these few, subsequent evaluation in the form of the sampling and analysis appears to have defined the relevant constituents. See below for additional discussion on selection of COPCs and the development of the associated health-based screening benchmarks.

Subsequent steps involved cleaning of some buildings and evaluating the effectiveness of the cleaning by sampling for the various COPCs identified. Findings (paraphrased) from this assessment are evaluated as follows:

- There was a pre-cleaning difference in the levels of contamination among units in the building.

The data appears to support this conclusion.

- The observation of WTC dust is an indicator that WTC contaminants may be present. Amount of dust correlates with the level of contamination

This finding is consistent with the results.

- Portions of the building with higher deposited WTC dust had higher levels of contamination.

Again, this finding appears consistent with the data.

- Concentrations of some contaminants in the WTC dust were elevated above health-based benchmarks

This is an accurate assessment

- The use of standard cleaning methods significantly reduced levels of WTC-related constituents with each cleaning event. However, 2-3 cleanings were sometimes needed to reduce the levels to below health-based benchmarks. Number of cleanings tended to correlate with the initial contaminant levels.

This finding is not unexpected. However, in light of this finding it is important for the sampling (and cleaning methods) to be consistently applied. Also, some measure of ongoing validation of the sampling strategy should be in place. It is my understanding that EPA will continue to for other COPCs, specifically metals and dioxins and other media including settled dust. I agree that this is appropriate.

- Conducting asbestos in air sampling after cleaning could be used as a surrogate method for determining if future cleaning was needed.

This is a critical finding for the determination that "asbestos air sampling was a conservative method for determining if additional cleaning was required". It would appear that the conclusion is based on the fact that air sampling results for asbestos was by far the most frequent cause for re-cleaning (82% versus 27% for the next highest cause, that from lead). In addition, it was found that cleaning was sometimes required because of the sampling technique (excess particulate matter) rather than a health-based exceedance. This finding would appear to present a compelling rationale for the use of this type of monitoring, especially in response to the low level of detections for other constituents that might be more toxic, e.g., dioxins, or more likely to be present, e.g., lead.

- EPA also found that the use of an Air Filtration Device during cleaning offered a slight advantage to reducing the potential for filter overloading.

It would be useful for EPA to include these statistics in its evaluation of "Number of Additional Cleaning Events Required based on Sampling Method" (Table 14 of the Confirmation Cleaning Report) to justify that "asbestos air sampling was a conservative method for determining if additional cleaning was required", regardless of the method used. Further, it would be wise for EPA to choose one set of conditions and apply these consistently, if this is not already being done.

- Finally, no measurable difference was found in the use of modified or aggressive air disturbance techniques.

The data appears to support this finding. However, for consistency EPA should probably choose one of these techniques.

In summary, although a number of activities were performed simultaneously because of the nature of the incident, the end result suggest would suggest that the choice of COPC is supported by the Confirmation Cleanup Study. The use of asbestos appears to be a reasonable surrogate of risk (combination of toxicity and exposure potential) from the other COPCs. I would, however, encourage EPA to continue to monitor some percentage of samples for the other COPCs for continued validation of the strategy

2. Do other contaminants that were measured in the Confirmation Cleaning Study provide equally good or better surrogates for determining the risk from other contaminants? If yes, please describe in detail which contaminants you would consider and why. If no, provide justification for your response.

Response: In synchrony with the Confirmation Cleanup Study, EPA developed the Report for Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks. There were several issues raised by the Peer Review Panel of the original document. I believe that these issues have been adequately addressed in EPA's World Trade Center Indoor Environment Assessment: Response to Peer Review Comments on the Report for Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks (May, 2003).

One of the significant concerns identified with the original report was the narrowing of COPCs too early in the process. EPA's response specifically addresses this concern by evaluating a longer list of constituents including those raised by the Panel. The revised document has a logical and clearly articulated rationale for inclusion of specific constituents and not others. I am particularly pleased with the discussion of individual constituents that were identified by EPA as well as others.

The methodologies used for deriving the health-based criteria are typically well-defined EPA risk assessment guidance methodology and assumptions. Some assumptions may even be considered overly conservative for some media, e.g., exposure assumptions for dust.

In addition, I understand that EPA will continue to monitor for COPCs, although air sampling of asbestos will remain the driver. I agree that this is appropriate.

An issue raised in the Peer Review and in other documents suggests that 1×10^{-4} may not be an appropriate point of departure for determining the appropriate health-based benchmarks. I would offer that there are several EPA precedents that would suggest that risk levels "around" 10^{-4} are appropriate in some situations. I have attached a couple of documents to this end. The first is USEPA's Directive on the Role of Risk Assessment in Baseline Assessments (USEPA, 1991). Quote from that document...

Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10 (to the 4th power), and the non-carcinogenic hazard quotient is less than 1, action generally is not warranted unless there are adverse environmental impacts.

The other document is the Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites (USEPA, 1998) that provides a cleanup level of 1 ppb TEQ for dioxins at residential sites for both Superfund and RCRA activities. This level corresponds to a 2.5×10^{-4} risk.

3. Do the reviewers know of any other contaminants associated with the World Trade Center that were not included in the COPC document or the Confirmation Cleaning Study that may serve as a surrogate for determining the risk from other contaminants? If so, please provide the details regarding these contaminants and the reasons why they should be considered. Provide citations for any references mentioned, and/or submit hard copies of the referenced documents.

I believe that EPA has adequately addressed the additional constituents encountered in sampling efforts at the WTC as reflected in Response to 2 above.